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FULL ESTIMATED COST

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STRUCTURE FILE UPDATES: 11 DEC 2006 HIGHEST RN 915185-72-7 DICTIONARY FILE UPDATES: 11 DEC 2006 HIGHEST RN 915185-72-7

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Uploading C:\Program Files\Stnexp\Queries\10702203.str

L1 STRUCTURE UPLOADED

=> d 11

L1 HAS NO ANSWERS

L1 STR

Structure attributes must be viewed using STN Express query preparation.

=> s 11 full

FULL SEARCH INITIATED 15:14:24 FILE 'REGISTRY'
FULL SCREEN SEARCH COMPLETED - 38 TO ITERATE

100.0% PROCESSED

38 ITERATIONS

4 ANSWERS

SEARCH TIME: 00.00.01

L2 4 SEA SSS FUL L1

=> file caplus

COST IN U.S. DOLLARS

SINCE FILE TOTAL ENTRY SESSION 166.94 167.15

FULL ESTIMATED COST

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FILE COVERS 1907 - 12 Dec 2006 VOL 145 ISS 25 FILE LAST UPDATED: 11 Dec 2006 (20061211/ED)

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http://www.cas.org/infopolicy.html
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L3
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PROCESSING COMPLETED FOR L3
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T.4
    ANSWER 1 OF 5 CAPLUS COPYRIGHT 2006 ACS on STN
ΑN
     2005:1001865 CAPLUS
DN
     143:300254
TI
    Photocleavable fluorescent nucleotides for nucleic acid sequencing on
    chips constructed by 1,3-dipolar azide-alkyne cycloaddition chemistry
IN
     Ju, Jingyue
PA
     The Trustees of Columbia University In the City of New York, USA
SO
    PCT Int. Appl., 50 pp.
    CODEN: PIXXD2
DT
    Patent
LA
    English
FAN.CNT 1
    PATENT NO.
                       KIND
                               DATE
                                          APPLICATION NO.
                                                                  DATE
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    WO 2005084367
PΙ
                       A2
                               20050915
                                           WO 2005-US6960
                                                                  20050303
    WO 2005084367
                        A3 20051222
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            CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD,
            GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
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            RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML,
            MR, NE, SN, TD, TG
PRAI US 2004-550007P
                        P
                               20040303
     This invention provides a method for determining the sequence of a DNA or an
    RNA, wherein (i) about 1000 or fewer copies of the DNA or RNA are bound to
     a solid substrate via 1,3-dipolar azide-alkyne cycloaddn. chemical and (ii)
     each copy of the DNA or RNA comprises a self-priming moiety.
     nucleic acid is contacted with a DNA or RNA polymerase and 4
    photocleavable fluorescent nucleotide analogs under conditions permitting
     nucleic acid synthesis. The identity of the incorporated nucleotide is
     determined, each of the nucleotide analogs having a different fluorescent
    wavelength from the other three.
IT
     857285-10-0
    RL: ARG (Analytical reagent use); ANST (Analytical study); USES (Uses)
        (photocleavable fluorescent nucleotides for nucleic acid sequencing on
       chips constructed by 1,3-dipolar azide-alkyne cycloaddn. chemical)
RN
     857285-10-0 CAPLUS
CN
     1H,5H,11H,15H-Xantheno[2,3,4-ij:5,6,7-i'j']diquinolizin-18-ium,
     9-[5-[[[3-[1-[[[3-[4-amino-7-[2-deoxy-5-0-[hydroxy[[hydroxy(phosphonooxy]]]]]]]]]]
     ) phosphinyl]oxy]phosphinyl]-\beta-D-erythro-pentofuranosyl]-7H-
    pyrrolo[2,3-d]pyrimidin-5-yl]-2-propynyl]amino]carbonyl]oxy]ethyl]-4-
     nitrophenyl]methyl]amino]carbonyl]-2-carboxyphenyl]-2,3,6,7,12,13,16,17-
     octahydro-, inner salt (9CI) (CA INDEX NAME)
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$$-02C$$
 $-02C$
 $NO2$
 $NO3$
 NO

$$\begin{array}{c} \text{HO} \\ \\ \\ \end{array} \begin{array}{c} \text{OPO}_3\text{H}_2 \end{array}$$

PAGE 1-B

PAGE 2-B



L4 ANSWER 2 OF 5 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2005:424578 CAPLUS

DN 143:110290

TI Four-color DNA sequencing by synthesis on a chip using photocleavable fluorescent nucleotides

AU Seo, Tae Seok; Bai, Xiaopeng; Kim, Dae Hyun; Meng, Qinglin; Shi, Shundi; Ruparel, Hameer; Li, Zengmin; Turro, Nicholas J.; Ju, Jingyue

CS Columbia Genome Center, Columbia University College of Physicians and Surgeons, New York, NY, 10032, USA

SO Proceedings of the National Academy of Sciences of the United States of America (2005), 102(17), 5926-5931 CODEN: PNASA6; ISSN: 0027-8424

PB National Academy of Sciences

DT Journal

LA English

AB We report four-color DNA sequencing by synthesis (SBS) on a chip, using four photocleavable fluorescent nucleotide analogs (dGTP-PC-Bodipy-FL-510, dUTP-PC-R6G, dATP-PC-ROX, and dCTP-PC-Bodipy-650) (PC, photocleavable; Bodipy, 4,4-difluoro-4-bora-3 α ,4 α -diaza-s-indacene; ROX, 6-carboxy-X-rhodamine; R6G, 6-carboxyrhodamine-6G). Each nucleotide analog consists of a different fluorophore attached to the 5 position of the pyrimidines and the 7 position of the purines through a photocleavable 2-nitrobenzyl linker. After verifying that these nucleotides could be successfully incorporated into a growing DNA strand in a solution-phase polymerase reaction and the fluorophore could be cleaved using laser irradiation (\approx 355 nm) in 10 s, we then performed an SBS reaction on a chip that contains a self-priming DNA template covalently immobilized by using 1,3-dipolar azide-alkyne cycloaddn. The DNA template was produced by PCR, using an azido-labeled primer, and the self-priming moiety was attached to the immobilized DNA template by enzymic ligation. Each cycle of SBS consists of the incorporation of the photocleavable fluorescent nucleotide into the DNA, detection of the fluorescent signal, and photocleavage of the fluorophore. The entire process was repeated to identify 12 continuous bases in the DNA template. These results demonstrate that photocleavable fluorescent nucleotide analogs can be incorporated accurately into a growing DNA strand during a polymerase reaction in solution and on a chip. Moreover, all four fluorophores can be detected and then efficiently cleaved using near-UV irradiation, thereby allowing continuous identification of the DNA template sequence. Optimization of the steps involved in this SBS approach will further

PAGE 2-B

RE.CNT THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD ALL CITATIONS AVAILABLE IN THE RE FORMAT

- ANSWER 3 OF 5 CAPLUS COPYRIGHT 2006 ACS on STN L4
- AN 2002:778224 CAPLUS
- 137:289902 DN
- DNA sequencing by mass spectrometry using mass-tagged solid phase ΤI capturable dideoxynucleotides having cleavable linker
- Ju, Jingyue; Edwards, John Robert; Li, Zengmin IN
- PΑ The Trustees of Columbia University in the City of New York, USA
- SO PCT Int. Appl., 97 pp.

CODEN: PIXXD2

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DT Patent
LA English
FAN.CNT 1
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PATENT NO.
                        KIND
                               DATE
                                         APPLICATION NO.
                                                                DATE
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PΙ
    WO 2002079519
                        A1
                               20021010
                                        WO 2002-US9752
                                                                 20020329
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            CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
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    US 2003027140
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                               20030206
                                         US 2001-823181
                                                                 20010330
    CA 2442862
                         AA
                               20021010
                                          CA 2002-2442862
                                                                 20020329
    EP 1383923
                         A1
                               20040128
                                          EP 2002-728606
                                                                 20020329
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            IE, SI, LT, LV, FI, RO, MK, CY, AL, TR
    JP 2004533608
                         T2
                               20041104
                                          JP 2002-577927
                                                                 20020329
PRAI US 2001-823181
                         Α
                               20010330
    WO 2002-US9752
                         W
                               20020329
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The present application discloses the use of biotinylated AB dideoxynucleotides for a high fidelity DNA sequencing system by mass spectrometry. Biotinylated dideoxynucleotides and streptavidin coated magnetic beads can be used to generate high quality sequencing mass spectra of Sanger cycle sequencing DNA fragments on a MALDI-TOF mass spectrometer. The method disclosed here provides an efficient way to eliminate false stopped DNA fragments and excess primers and salts in one simple purification step, while still allowing the use of cycle sequencing to generate a high yield of sequencing fragments. The subject application discloses that mass-tagged dideoxynucleotides which are coupled with biotin or photocleavable biotin can increase the mass separation of the DNA sequencing fragments on the mass spectra, giving better resolution than previously achievable. Also, this application discloses a method for creating streptavidin-coated porous channels that can be used in light directed cleavage of the biotin-streptavidin complex. This is important as present com. available streptavidin coated magnetic beads are inadequate for photocleavage purposes, in that they are opaque to UV light. Compared to gel electrophoresis sequencing, this system produces very high resolution of sequencing fragments and extremely fast separation in the

time scale of microseconds. The invention provides a linker for attaching a chemical moiety to a dideoxynucleotide, wherein the linker comprises a derivative of 4-aminomethylbenzoic acid. The invention provides a labeled dideoxynucleotide, which comprises a chemical moiety attached via a linker to a 5-position of cytosine or thymine or to a 7-position of adenine or guanine. The invention provides a' method of increasing mass spectrometry resolution between different DNA sequencing fragments, which comprises attaching different linkers to different dideoxynucleotides used to terminate a DNA sequencing reaction and generate different DNA sequencing fragments, wherein the different linkers increase mass separation between the different DNA sequencing fragments, thereby increasing mass spectrometry resolution

IT 467218-69-5

RL: ARG (Analytical reagent use); ANST (Analytical study); USES (Uses) (ddATP-Linker II-PC-Biotin; DNA sequencing by mass spectrometry using mass-tagged solid phase capturable dideoxynucleotides having cleavable linker)

RN 467218-69-5 CAPLUS

CN Carbamic acid, [3-[4-amino-7-[(2R,5S)-tetrahydro-5-(3,5,7,7-tetrahydroxy-3,5,7-trioxido-2,4,6-trioxa-3,5,7-triphosphahept-1-yl)-2-furanyl]-7H-pyrrolo[2,3-d]pyrimidin-5-yl]-2-propynyl]-, 1-[5-[[[6-[[5-[(3aS,4S,6aR)-

hexahydro-2-oxo-1H-thieno[3,4-d]imidazol-4-yl]-1-oxopentyl]amino]-1-oxohexyl]amino]methyl]-2-nitrophenyl]ethyl ester (9CI) (CA INDEX NAME)

Absolute stereochemistry.

PAGE 1-A

PAGE 1-B

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 4 OF 5 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2002:276113 CAPLUS

DN 136:305088

TI Massively parallel nucleic acid sequencing using dye-labeled nucleotides with 3'-hydroxy groups protected by a small labile moiety and immobilized hairpin loop primers

IN Ju, Jingyue; Li, Zengmin; Edwards, John Robert; Itagaki, Yasuhiro

PA The Trustees of Columbia University In the City of New York, USA

SO PCT Int. Appl., 121 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 2

| PATENT NO. KIND DATE APPLICATION NO. | DATE |
|---|-----------|
| | |
| | |
| PI WO 2002029003 A2 20020411 WO 2001-US31243 | 20011005 |
| WO 2002029003 A3 20020718 | |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA | , CH, CN, |
| CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD | , GE, GH, |
| GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC | LK, LR, |

LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG CA 2425112 AA 20020411 CA 2001-2425112 20011005 AU 2001096645 **A5** 20020415 AU 2001-96645 20011005 EP 1337541 20030827 A2 EP 2001-977533 20011005 AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR JP 2004510433 Т2 20040408 JP 2002-532574 20011005 PRAI US 2000-684670 Α 20001006 US 2001-300894P Ρ 20010626 WO 2001-US31243 W 20011005 MARPAT 136:305088

os

This invention provides methods for attaching a nucleic acid to a solid AB surface and for sequencing nucleic acid by detecting the identity of each nucleotide analog after the nucleotide analog is incorporated into a growing strand of DNA in a polymerase reaction. The invention also provides nucleotide analogs which comprise unique labels, such as mass labels or fluorescent dyes, attached to the nucleotide analog through a cleavable linker, and a cleavable chemical group to cap the -OH group at the 3'-position of the deoxyribose. The method uses an array of immobilized primers in which the primers are partially double stranded and form a hairpin loop. As individual bases are incorporated by primer extension, they are identified by the nature of the reporter group. The 3'-blocking group is then removed and the next base is added to primer extension product.

IT 407581-93-5 407581-95-7

> RL: ARU (Analytical role, unclassified); ANST (Analytical study) (DNA sequencing using; massively parallel sequencing using dye-labeled nucleotides with 3'-hydroxy groups protected by small labile moiety and immobilized hairpin loop primers)

RN 407581-93-5 CAPLUS

CN Carbamic acid, [3-[4-amino-7-[2-deoxy-5-0-[hydroxy[[hydroxy(phosphonooxy)p hosphinyl]oxy]phosphinyl]-3-0-(methoxymethyl)-β-D-erythropentofuranosyl]-7H-pyrrolo[2,3-d]pyrimidin-5-yl]-2-propynyl]-, C-[1-[5-[[(3',6'-dihydroxy-3-oxospiro[isobenzofuran-1(3H),9'-[9H]xanthen]-6-yl)carbonyl]amino]methyl]-2-nitrophenyl]ethyl] ester (9CI) (CA INDEX NAME)

RN 407581-95-7 CAPLUS

CN Carbamic acid, [3-[4-amino-7-[2-deoxy-5-O-[hydroxy[hydroxy(phosphonooxy)p hosphinyl]oxy]phosphinyl]-3-O-2-propenyl-β-D-erythro-pentofuranosyl]-7H-pyrrolo[2,3-d]pyrimidin-5-yl]-2-propynyl]-, C-[1-[5-[[(3',6'-dihydroxy-3-oxospiro[isobenzofuran-1(3H),9'-[9H]xanthen]-6-yl)carbonyl]amino]methyl]-2-nitrophenyl]ethyl] ester (9CI) (CA INDEX NAME)

T.4 ANSWER 5 OF 5 CAPLUS COPYRIGHT 2006 ACS on STN

2002:575630 CAPLUS AN

DN 137:136024

TI Massively parallel nucleic acid sequencing using dye-labeled nucleotides with 3'-hydroxy groups protected by a small labile moiety and immobilized hairpin loop primers

IN Ju, Jingyue; Li, Zengmin; Edwards, John Robert; Itagaki, Yasuhiro

PAThe Trustees of Columbia University in the City of New York, USA

SO U.S. Pat. Appl. Publ., 54 pp., Cont.-in-part of U.S. Ser. No. 684,670. CODEN: USXXCO

Patent DТ

English LA

FAN.CNT 2

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|-------------------|------------|----------|-----------------|----------|
| | | | | | |
| PΙ | US 2002102586 | A1 | 20020801 | US 2001-972364 | 20011005 |
| | US 6664079 | B2 | 20031216 | | |
| | US 2004185466 | A1 | 20040923 | US 2003-702203 | 20031106 |
| PRAI | US 2000-684670 | A2 | 20001006 | | |
| | US 2001-300894P | P | 20010626 | | |
| | US 2001-972364 | A 3 | 20011005 | | |
| os | MARPAT 137:136024 | | | | |

AB This invention provides methods for attaching a nucleic acid to a solid surface and for sequencing nucleic acid by detecting the identity of each nucleotide analog after the nucleotide analog is incorporated into a growing strand of DNA in a polymerase reaction. The invention also provides nucleotide analogs which comprise unique labels attached to the nucleotide analog through a cleavable linker, and a cleavable chemical group to cap the -OH group at the 3'-position of the deoxyribose. The invention also provides nucleotide analogs which comprise unique labels, such as mass labels or fluorescent dyes, attached to the nucleotide analog through a cleavable linker, and a cleavable chemical group to cap the -OH group at the 3'-position of the deoxyribose. The method uses an array of immobilized primers. As individual bases are incorporated by primer extension, they are identified by the nature of the reporter group. The reporter moiety and the 3'-blocking group are then removed and the next base is added to primer extension product.

407581-93-5 407581-95-7

RL: ARU (Analytical role, unclassified); ANST (Analytical study) (DNA sequencing using; massively parallel sequencing using dye-labeled nucleotides with 3'-hydroxy groups protected by small labile moiety and immobilized hairpin loop primers)

RN 407581-93-5 CAPLUS

CN Carbamic acid, [3-[4-amino-7-[2-deoxy-5-O-[hydroxy[[hydroxy(phosphonooxy)p
 hosphinyl]oxy]phosphinyl]-3-O-(methoxymethyl)-β-D-erythro pentofuranosyl]-7H-pyrrolo[2,3-d]pyrimidin-5-yl]-2-propynyl]-,
 C-[1-[5-[[[(3',6'-dihydroxy-3-oxospiro[isobenzofuran-1(3H),9'-[9H]xanthen] 6-yl)carbonyl]amino]methyl]-2-nitrophenyl]ethyl] ester (9CI) (CA INDEX
 NAME)

Absolute stereochemistry.

PAGE 1-B

RN 407581-95-7 CAPLUS

CN Carbamic acid, [3-[4-amino-7-[2-deoxy-5-O-[hydroxy[[hydroxy(phosphonooxy)p
hosphinyl]oxy]phosphinyl]-3-O-2-propenyl-β-D-erythro-pentofuranosyl]7H-pyrrolo[2,3-d]pyrimidin-5-yl]-2-propynyl]-, C-[1-[5-[[[(3',6'-dihydroxy-3-oxospiro[isobenzofuran-1(3H),9'-[9H]xanthen]-6-yl)carbonyl]amino]methyl]2-nitrophenyl]ethyl] ester (9CI) (CA INDEX NAME)

PAGE 1-B